



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/518,345

12/17/2004

Yoko Watanabe

075834.00404

5254

33448

7590

06/11/2008

ROBERT J. DEPKE

LEWIS T. STEADMAN

ROCKEY, DEPKE & LYONS, LLC

SUITE 5450 SEARS TOWER

CHICAGO, IL 60606-6306

EXAMINER

JELSMA, JONATHAN G

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

06/11/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/518,345	<b>Applicant(s)</b> WATANABE ET AL.	
	<b>Examiner</b> Jonathan Jelsma	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 11-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 2,6 and 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 December 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/05/2008, 12/17/2004</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Summary***

1. This is the first office action based on application 10/518,345 filed on 12/17/2004 by Yoko Watanabe, Shinji Omori, Kazuya Iwase, Keiko Amai, and Masaki Yoshizawa.
2. The claims were subject to a restriction requirement. Applicant's election of group I claims 1-10 in the reply filed on 03/24/2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 11-28 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected method of inspecting a mask, and method of producing a mask, there being no allowable generic or linking claim.

### ***Drawings***

3. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

4. Claim 2 is objected to because of the following informalities: in lines 2-4 of claim 2 recites "thickness and material of said thin film for inspection are equal to those of said thin film for exposure." It is unclear how the material of the thin film for inspection and thin film for exposure are "equal." Appropriate correction is required.
5. Claims 6-7 are objected to because of the following informalities: in lines 3 and 4 of claims 6 and 7 recite "... is different each other." Whereas it should recite "... is different *from* each other." Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
7. Claims 3-4, and 8-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
8. Claims 3 and 4 recite the limitations "said non-transmission portion" and "said transmission portion" in lines 2 and 3 of claim 3, and lines 2 and 3 of claim 4. There is insufficient antecedent basis for this limitation in the claim. Claim 3 refers to claim 1, which recites a transmission portion and non-transmission portion for either the thin film for exposure and the thin film for inspection. It is unclear which of the said transmission portion or non-transmission portion claim 3 refers to.

9. Claim 8 recites the limitation "... wherein said thin film for exposure comprises a *first vulnerable portion* that the probability of pattern damage *is the highest in said thin film for exposure* ... said thin film for inspection comprises a second vulnerable portion that the probability of pattern damage *is higher than said first vulnerable portion.*" This contradicts itself since, the area of highest probability of damage is in the exposure area, yet the claim recites that the second vulnerable portion in the inspection film is higher. Therefore, the claim is indefinite since it is unclear which area has the greater probability for pattern damage.

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 1-3, 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over GUCKEL (US 5,866,281) in view of SUWA (US 2001/0021546 A1).

13. GUCKEL teaches a mask comprising a thick film, the silicon wafer (47) which supports the main exposure film (102) (column 13 lines 55-58, and column 15 lines 59-61). The thin film for exposure is made of an x-ray blocking material (column 15 lines 53-55). The exposure pattern is formed by developing away the non-transmitting areas, creating apertures for the transmissive portion (column 14 lines 45-63, see figures 11, 15 and 16).

14. GUCKEL does not explicitly teach having a thin film for inspection formed at a distance from the exposure area.

15. However, SUWA teaches a mask with a circuit pattern and an inspection pattern on the same mask (paragraph 0011). This inspection pattern may be formed in a separate area to the circuit pattern, and would be in the same layer material so that the thickness and material for the inspection pattern and the exposure pattern will be the same (paragraph 0016).

16. At the time of the invention one having ordinary skill in the art would have been motivated to add the inspection region of SUWA to the mask of GUCKEL in order to measure the line width of the pattern and eliminate the time required for mask exchange by having the inspection pattern on the same mask (SUWA paragraphs 0010-0011).

17. Neither GUCKEL nor SUWA explicitly teaches that the area of the thin film for inspection is larger than the thin film for exposure, or that the flexure of the thin film for inspection is bigger than that of the thin film for exposure. Further neither GUCKEL nor SUWA explicitly teach that the thin film for inspection has a transmission portion with line width and density different from each other.

Art Unit: 1795

18. However, SUWA does teach that since the inspection pattern is formed in a separate area than the circuit, or exposure pattern, the shape and position of the inspection pattern may be flexibly designed (paragraph 0016). Further SUWA teaches that the inspection pattern comprises of a first linear pattern with one line width and a second linear pattern with a different line width (paragraph 0026). And that the measurement of this line width of this inspection pattern is used to determine with high accuracy the line width of the main circuit, or exposure pattern (paragraph 0025).

19. Therefore, at the time of the invention one having ordinary skill in the art would have been motivated to alter the line width and density , and even the flexure of the inspection patter as a matter of routine experimentation in order to have a pattern which accurately represents the main exposure pattern.

20. Further neither GUCKEL nor SUWA explicitly teach a first vulnerable area to pattern damage in the exposure patter, and a second higher vulnerable area in the inspection region.

21. However, at the time of the invention one having ordinary skill in the art would recognize that all pattern areas would have vulnerable areas to pattern damage inherently. Further one having ordinary skill in the art would recognize that since SUWA teaches using the inspection pattern to measure attributes of the exposure pattern, that by having the higher probability in pattern damage in the inspection patter would have been obvious in order to provide early detection on the damage, prior to the damage showing up in the main field region. The alteration of the line width and density of the

inspection pattern in order to achieve the desired inspection pattern would have been obvious as discussed above.

22. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over GUCKEL (US 5,866,281) in view of SUWA (US 2001/0021546 A1), as applied to claims 1-3 and 5-10 above, and further in view of SUZUKI (US 6,768,124 B2).

23. Claim 4 is dependent upon claim 1, which is rejected above in view of GUCKEL and SUWA under 35 U.S.C. 103(b). Neither GUCKEL nor SUWA explicitly teaches that the non-transmission portion comprises a beam scatterer for exposure formed on thin film.

24. However, SUZUKI teaches a membrane with scatters electrons during electron beam exposure (column 10 lines 18-33).

25. At the time of the invention one having ordinary skill in the art would have been motivated to use the electron beam scattering membrane of SUZUKI in the mask of GUCKEL and SUWA in order to pattern using an electron beam exposure apparatus to pattern a resist (SUZUKI column 10 lines 28-33).

### ***Conclusion***

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Jelsma whose telephone number is (571)270-5127. The examiner can normally be reached on Monday to Thursday 7:00 a.m. - 5:00 p.m.



27. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

28. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JGJ

**/Mark F. Huff/  
Supervisory Patent Examiner, Art Unit 1795**